IN THE SPECIFICATION

Please insert the following paragraph [000.1], with the associated heading, after the title and before paragraph [001]:

CROSS-REFERENCE TO RELATED APPLICATIONS

Paragraph [000.1] The present application is the U.S. National phase of PCT International Application No. PCT/JP2003/016346, filed 19 December 2003. The referenced PCT Application claimed priority under 35 U.S.C. §119 from each of the following priority documents: Japanese Patent Application No. 2002-370635, filed on 20 December 2002; Japanese Patent Application No. 2002-370642, filed on 20 December 2002; Japanese Patent Application No. 2002-370657, filed on 20 December 2002; Japanese Patent Application No. 2002-370669, filed on 20 December 2002; and Japanese Patent Application No. 2002-370685, filed on 20 December 2002. The entire disclosure of the parent PCT Application, as well as the entire disclosure each of the above-referenced Japanese priority documents is hereby incorporated by reference.

Please replace paragraph [005] with the following amended paragraph:

Paragraph [005] Conveyance systems are generally individually set up to the layout of machining facilities in factories that are to incorporate those conveyance systems. This is because the distance over which workpieces are conveyed by the conventional conveyance systems cannot flexibly be changed.

Please replace paragraph [014] with the following amended paragraph:

Paragraph [014] Usually, since those two conveyance means are given as individual independent conveyance means, a wide space is needed to install the two conveyance means therein. If one conveyance means is to convey workpieces bidirectionally in the forward and reverse directions, then a complex gear structure and a plurality of motors are required. No simple bidirectional actuating [[means]]conveyors have been proposed in the art.

Please replace paragraph [032] with the following amended paragraph:

Paragraph [032] A conveyance system according to an illustrative embodiment of the present invention includes a conveyance carriage assembly for carrying a workpiece thereon, and conveyance units to which the conveyance carriage assembly is conveyed, wherein the conveyance carriage assembly has driven members, the conveyance units are separable into units, each of the units having a rail for guiding the conveyance carriage assembly, and a driver associated with the rail for driving the conveyance carriage assembly through the driven members~~, and wherein w~~. When the last one of the driven members is separated from a movable range of the driver, at least the foremost one of the driven members is relayed to the driver of the unit adjacent thereto, and the conveyance carriage assembly is continuously conveyed.

Please replace paragraph [035] with the following amended paragraph:

Paragraph [035] The units may comprise three units, including a horizontal conveyance unit for linearly conveying the conveyance carriage assembly, a gradient conveyance unit for conveying the conveyance carriage assembly on an upward grade and/or a downward grade, and a direction-changing unit for changing a conveyance direction of the conveyance carriage assembly, wherein a plurality of types of the units are combined with each other.

Please replace paragraph [043] with the following amended paragraph:

Paragraph [043] The driven sprocket may be lowered by a force-bearing member for directly bearing a pressing force from the push-out cam plate, and a resilient member compressible in interlinked relation to the force-bearing member.

Please replace paragraph [046] with the following amended paragraph:

Paragraph [046] The driven sprocket may be lowered by a force-bearing member for directly bearing a pressing force from the lowering cam plate, and a resilient member compressible in interlinked relation to the force-bearing member. With the lowering sprocket being lowered by the bearing member and the resilient member, even if the lowering sprocket and the gradient conveyance annular chain are out of phase with each other, the teeth of the lowering sprocket do not unduly press chain rollers of the gradient conveyance annular chain, and they are prevented from being damaged.

Please replace paragraph [074] with the following amended paragraph:

Paragraph [074] The stopping engaging member may double as a guided member which is guided by a direction-changing unit which is interposed between a first conveyance section for conveying the conveyance carriage assembly in one direction and a second conveyance section for conveying the conveyance carriage assembly in a direction different from the one direction.

Please replace paragraph [077] with the following amended paragraph:

Paragraph [077] FIG. 1 is a side elevational view, partly omitted from illustration, of a conveyance system according to a[[n]] selected illustrative embodiment of the present invention;

Please replace paragraph [078] with the following amended paragraph:

Paragraph [078] FIG. 2 is a top plan view, partly omitted from illustration, of the conveyance system according to the illustrative embodiment of the present invention;

Please replace paragraph [080] with the following amended paragraph:

Paragraph [080] FIG. 4 is an exploded perspective view of an end portion of the horizontal conveyance unit;

Please replace paragraph [081] with the following amended paragraph:

Paragraph [081] FIG. 5 is a sectional plan view of a bearing box, which is part of the end portion of FIG. 4, also showing driven bevel gears, driven sprockets, and nearby components;

Please replace paragraph [082] with the following amended paragraph:

Paragraph [082] FIG. 6 is an exploded perspective view of a motor unit, which is also shown in FIG. 3;

Please replace paragraph [083] with the following amended paragraph:

Paragraph [083] FIG. 7 is a~~n exploded~~ perspective view, partly omitted from illustration, of the end of the horizontal conveyance unit of FIG. 4, shown in an assembled configuration with a chain;

Please replace paragraph [084] with the following amended paragraph:

Paragraph [084] FIG. 8 is an exploded perspective view of another end of the horizontal conveyance unit which is [[an]] opposite to the end shown in FIG. 4;

Please replace paragraph [085] with the following amended paragraph:

Paragraph [085] FIG. 9 is a perspective view, partly omitted from illustration, of adjacent ends of two horizontal conveyance units, two joint plates, and a support post;

Please replace paragraph [086] with the following amended paragraph:

Paragraph [086] FIG. 10 is a side elevational view of portions of two horizontal conveyance units and a gradient conveyance unit;

Please replace paragraph [088] with the following amended paragraph:

Paragraph [088] FIG. 12 is a fragmentary perspective view of a direction-changing unit according to the system hereof;

Please replace paragraph [091] with the following amended paragraph:

Paragraph [091] FIG. 15 is a plan view of the directional changer of FIG. 12;

Please replace paragraph [092] with the following amended paragraph:

Paragraph [092] FIG. 16 is a front elevational view, partly in cross section, of a rail, a horizontal upper guide, a horizontal lower guide, and a first conveyance carriage according to the system hereof;

Please replace paragraph [107] with the following amended paragraph:

Paragraph [107] FIG. 31 is an enlarged view, partly cut away, showing the manner by which an outer movable plate and an inner movable plate are displaced away from each other by the rack-and-pinion mechanism shown in FIG. 28;

Please replace paragraph [114] with the following amended paragraph:

Paragraph [114] FIG. 38 is a perspective view of a connecting rod, which is an example of a workpiece which can be carried by the conveyance system hereof.

Please replace paragraph [115], and its associated heading, with the following amended paragraph and heading:

DETAILED DESCRIPTION INCLUDING BEST MODE FOR CARRYING OUT THE

INVENTION

Paragraph [115] A conveyance system according to a ~~preferred~~ selected illustrative embodiment of the present invention will be described below with reference to FIGS. 1 through 37.

Please replace paragraph [116] with the following amended paragraph:

Paragraph [116] As shown in FIG. 1, a conveyance system 10 according to the present invention has a joint conveyance carriage assembly 12 capable of conveying a workpiece and a conveyance assembly 14 for conveying the joint conveyance carriage assembly 12, the conveyance assembly 14 providing a conveyance path for transferring workpieces between areas of a industrial plant.

Please replace paragraph [118] with the following amended paragraph:

Paragraph [118] As shown in FIG. 2, the conveyance assembly 14 has a function to convey the joint conveyance carriage assembly 12 to the right (in the direction indicated by the arrow B) in an upper region in FIG. 2, and to deliver the joint conveyance carriage assembly 12 to the left (in the direction indicated by the arrow A) in a lower region in FIG. 2. The conveyance assembly 14 also has a function to change the direction in which the joint conveyance carriage assembly 12 is delivered at the left and right ends. A plurality of joint conveyance carriage assemblies 12 can simultaneously be conveyed. In the description which follows, a section where the joint conveyance carriage assembly 12 is conveyed in the direction indicated by the arrow A in the lower region in FIG. 2 is referred to as a ~~return~~forward path, and a section where the joint conveyance carriage assembly 12 is conveyed in the direction indicated by the arrow B in the upper region in FIG. 2 is referred to as a return path.

Please replace paragraph [120] with the following amended paragraph:

Paragraph [120] Referring back to FIG. 1, the conveyance assembly 14 has a plurality of horizontal conveyance units 16 for conveying the joint conveyance carriage assembly 12 substantially horizontally in the direction indicated by the arrow B, a gradient conveyance unit 18 interconnecting the horizontal conveyance units 16, a direction-changing unit 20 for changing the direction in which the joint conveyance carriage assembly 12 is conveyed (hereinafter referred to simply as "conveyance direction"), a plurality of support posts 22 supporting the horizontal conveyance units 16, the gradient conveyance unit 18, and the direction-reversing unit (direction-changing unit) 20, and a cover 24 covering the horizontal conveyance units 16, the gradient conveyance unit 18, and the direction-reversing unit 20 substantially in their entirety. The horizontal conveyance units 16 and the gradient conveyance unit 18 are connected to each other by a joint plate 120 (see FIG. 3).

Please replace paragraph [139] with the following amended paragraph:

Paragraph [139] The end of the direction-reversing unit 20 (see FIGS. 1 and 2) is of a structure identical to the structure shown in FIG. 4.

Please replace paragraph [169] with the following amended paragraph:

Paragraph [169] The horizontal conveyance unit 16 and the direction-reversing unit 20 (see FIGS. 1 and 2), and the direction-reversing unit 20 and the gradient conveyance unit 18 are also connected to each other in the same manner as the horizontal conveyance units 16 are connected to each other.

Please replace paragraph [170] with the following amended paragraph:

Paragraph [170] The direction-reversing unit 20 will be described below.

Please replace paragraph [171] with the following amended paragraph:

Paragraph [171] As shown in FIGS. 12 and 13, the direction-reversing unit 20 has a rotational shaft 370, and first and second disks 374, 376 coupled to the rotational shaft 370 respectively by screws 372a, 372b, the first and second disks 374, 376 being rotatable upon rotation of the rotational shaft 370. O-rings 378 (see FIG. 13) are mounted on respective circumferential side walls of the first and second disks 374, 376.

Please replace paragraph [172] with the following amended paragraph:

Paragraph [172] The direction-reversing unit 20 also has a forward-path chain 330 and a return-path chain 332 which are circulatively driven by a motor 32b shown in FIG. 1 as with the annular chains 30, 33 of the horizontal conveyance unit 16. The joint conveyance carriage assembly 12 is conveyed to shift from the chain 33 to the forward-path chain 330, and enters the direction-reversing unit 20. After having been reversed in direction by the direction-reversing unit 20, the joint conveyance carriage assembly 12 is conveyed to shift from the return-path chain 332 to the annular chain 30.

Please replace paragraph [173] with the following amended paragraph:

Paragraph [173] The direction-reversing unit 20 has an auxiliary propelling mechanism 390 for conveying the joint conveyance carriage assembly 12 from the horizontal conveyance unit 16 to the first and second disks 374, 376 or from the first and second disks 374, 376 to the horizontal conveyance unit 16.

Please replace paragraph [175] with the following amended paragraph:

Paragraph [175] As shown in FIG. 13, the direction-reversing unit 20 and the auxiliary propelling mechanism 390 are mounted on a mount base 402 disposed on a support post 22. The small sprocket 396 is mounted on a vertically extending rotational shaft 404 that is rotatably supported on the mount base 402.

Please replace paragraph [177] with the following amended paragraph:

Paragraph [177] The reversing-unit driven bevel gear 408 has a through hole defined therein, and a shaft 410 extends through the through hole and has an end projecting therefrom. The reversing-unit second driven sprocket 394 is fitted over the projecting end of the shaft 410. The reversing-unit first driven sprocket 392 is fitted over the other end of the shaft 410. When the motor 32b is energized to rotate a drive sprocket 36b (see FIG. 1) of the direction-reversing unit 20, the forward-path chain 330 (see FIGS. 12 and 14) is circulatingly driven, rotating the reversing-unit first driven sprocket 392. The reversing-unit main bevel gear 406 and the reversing-unit driven bevel gear 408 are rotated, finally rotating the reversing-unit second driven sprocket 394, the rotational shaft 404, and the small sprocket 396.

Please replace paragraph [189] with the following amended paragraph:

Paragraph [189] The drive power transmitter 226, together with the upper rollers 216, is supported on the front shaft 220 and the rear shaft 222. The joint 230 is a ball joint (or a universal joint or the like) which allows the joint bar 208 to swing in any of horizontal and vertical directions. The joint 230 may be made of an elastic material that is elastically deformable in any of horizontal and vertical directions. The joint 230 allows the first through fourth conveyance carriages 200, 202, 204, 206 to be tilted vertically in the gradient conveyance unit 18 and also to be turned in a horizontal plane of the direction-reversing unit 20.

Please replace paragraph [190] with the following amended paragraph:

Paragraph [190] The first conveyance carriage 200 also has two upper rollers 232 for use in a braking action in the station 26 and a direction-reversing action in the direction-reversing unit 20. Two lower rollers 234 are disposed vertically downwardly of the upper rollers 232, respectively, for use in a direction-reversing action in the direction-reversing unit 20. A stopper 238 (see FIG. 34) used by the stopping mechanism 2010 of the station 26 is disposed on the inner surface of the base plate 210.

Please replace paragraph [206] with the following amended paragraph:

Paragraph [206] As shown in FIG. 23, the drive power transmitter 226 has a horizontally elongate plate 258 including a slightly thick front portion, a swing plate 260 disposed inwardly of the horizontally elongate plate 258 (toward the viewer of FIG. 23) and rotatably supported on the front shaft 220, a spring 262 for pressing the swing plate 260 upwardly with respect to the horizontally elongate plate 258, a shaft 264 fitted in a hole 260a defined in a rear portion of the swing plate 260, a small frame 266 rotatably supported, together with the swing plate 260, on the shaft 264, two springs (resilient members) 268 for pressing the small frame 266 with respect to the swing plate 260, and a roller (force-bearing member) 270 for being pressed downwardly by the cam plate 56 or 180 (see FIG. 1).

Please replace paragraph [292] with the following amended paragraph:

Paragraph [292] Moreover, because the horizontal conveyance units 16 and the gradient conveyance unit 18 are separable from each other, the number of horizontal conveyance units 16 and gradient conveyance units 18 may be increased or reduced depending on the layout of machine tools used, thereby adjusting the conveyance

distance. As the horizontal conveyance units 16, the gradient conveyance unit 18, and the direction-reversing units 20 are separable from and connectable to each other, they can conveniently be assembled and managed, and they can easily be replaced in the event of failures.

Please replace paragraph [294] with the following amended paragraph:

Paragraph [294] Horizontal conveyance units 16 can be connected to and separated from each other simply by using the joint plate 120, the support posts 22, and the bolts 61. It is not necessary to separate and machine the motors, the horizontal conveyance annular chains, etc. The horizontal conveyance units 16, the gradient conveyance unit 18, and the direction-reversing units 20 can also be connected to and separated from each other in the same manner. The horizontal conveyance units 16 should preferably have a length of about 2 meters.

Please replace paragraph [313] with the following amended paragraph:

Paragraph [313] Operation of the direction-reversing unit 20 will be described below with reference to FIGS. 12 through 15. In the present embodiment, it is assumed that the joint conveyance carriage assembly 12 which has traveled in the direction indicated by the arrow A in FIGS. 2, 12, and 15 is reversed by the direction-reversing unit 20 to travel in the direction indicated by the arrow B.

Please replace paragraph [314] with the following amended paragraph:

Paragraph [314] The forward-path chain 330 and the return-path chain 332 are circulatingly operated by the motor 32b and drive sprocket 36b. The forward-path chain 330 and the return-path chain 332 of the direction-reversing unit 20 are thus circulatingly operated.

Please replace paragraph [315] with the following amended paragraph:

Paragraph [315] Since the forward-path chain 330 is trained around the reversing-unit first driven sprocket 392 disposed in the direction-reversing unit 20 (see FIG. 12), the reversing-unit first driven sprocket 392, the reversing-unit second driven sprocket 394, and the rotational shaft 404 are also rotated. The chain 400 trained around the small sprocket 396 which is rotated by the rotational shaft 404 and the large sprocket 398 rotates the rotational shaft 370, the first disk 374, and the second disk 376. Thus, the auxiliary propelling mechanism 390 is also in operation, and the first disk 374 and the second disk 376 are continuously rotated at all times irrespective of whether the joint conveyance carriage assembly 12 reaches the direction-reversing unit 20 or not.

Please replace paragraph [317] with the following amended paragraph:

Paragraph [317] When the joint conveyance carriage assembly 12 travels to the direction-reversing unit 20, the chain presser plate 242 of the first conveyance carriage 200 is shifted from the chain 33 of the horizontal conveyance unit 16 to the chain 330 of the direction-reversing unit 20. Thereafter, the joint conveyance carriage assembly 12 is moved by the chain 330 of the direction-reversing unit 20.

Please replace paragraph [318] with the following amended paragraph:

Paragraph [318] In the direction-reversing unit 20, the lower rollers 234 and the upper rollers 232 of the first conveyance carriage 200 of the joint conveyance carriage assembly 12 enter between the first guide members 412, 412 and the second guide members 414, 414. As the joint conveyance carriage assembly 12 travels on, the lower rollers 234 and the upper rollers 232 of the first conveyance carriage 200 are held by the curved portions of the first guide members 412, 412 and the first disk 374 or the

second disk 376.

Please replace paragraph [321] with the following amended paragraph:

Paragraph [321] The joint conveyance carriage assembly 12 is shifted from the return-path chain 332 of the direction-reversing unit 20 to the annular chain 30 of the horizontal conveyance unit 16. Subsequently, the joint conveyance carriage assembly 12 is moved on the rail 28 in the direction indicated by the arrow B in FIG. 12 by the annular chain 30 of the horizontal conveyance unit 16. That is, the joint conveyance carriage assembly 12 is guided by the rail 28a and moved in the direction indicated by the arrow A in FIG. 12, then is turned 180° in direction by the direction-reversing unit 20, and guided by the rail 28b and moved in the direction indicated by the arrow B.

Please replace paragraph [322] with the following amended paragraph:

Paragraph [322] Since the lower rollers 234 and the upper rollers 232 are cylindrical in shape, the direction-reversing unit 20 allows the first through fourth conveyance carriages 200, 202, 204, 206 to turn easily.

Please replace paragraph [325] with the following amended paragraph:

Paragraph [325] The direction-reversing unit 20 can be operated by the motor 32b which circulatingly operates the forward-path chain 330 and the return-path chain 332. Specifically, the drive means for operating the direction-reversing unit 20 does not need to be separate from the drive means for operating the forward-path chain 330 and the return-path chain 332. Accordingly, the direction-reversing unit 20 may be simplified in structure.

Please replace paragraph [326] with the following amended paragraph:

Paragraph [326] When the joint conveyance carriage assembly 12 is released from the rail 28a and the forward-path chain 330, turned, or starts being moved by the rail 28b and the return-path chain 332, no shock is applied to the joint conveyance carriage assembly 12. Specifically, when the joint conveyance carriage assembly 12 is turned by the direction-reversing unit 20, the joint conveyance carriage assembly 12 can be transferred from the forward-path chain 330 to the return-path chain 332 without being subjected to shocks. Consequently, the connecting rod 1 is prevented from falling off the joint conveyance carriage assembly 12 and from being damaged.

Please replace paragraph [357] with the following amended paragraph:

Paragraph [357] In the description which follows, it is assumed that the joint conveyance carriage assembly 12 which has traveled in the direction indicated by the arrow A in FIG. 2 is stopped by the stopping mechanism 2010 while it is being reversed by the direction-reversing unit 20 to travel in the direction indicated by the arrow B.

Please replace paragraph [379] with the following amended paragraph:

Paragraph [379] In the above embodiment, the direction-reversing unit 20 changes the direction of travel of the joint conveyance carriage assembly 12 through 180°. However, the direction-reversing unit 20 may change the direction of travel of the joint conveyance carriage assembly 12 through 90°. According to this modification, the direction can easily be changed if one upper roller 232 and one lower roller 234 are employed.

IN THE ABSTRACT

Please replace the abstract with the following amended abstract: